

REMARKS

Please reconsider the application in view of the following remarks. The Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 132-150 are pending in this application. Claim 132 is independent. The remaining claims depend, directly or indirectly, from claim 132.

Rejection(s) under 35 U.S.C § 103

REJECTIONS OF CLAIMS 132-135, 139, 140, 143, 145, 146, AND 148-150:

Claims 132-135, 139, 140, 143, 145, 146, and 148-150 stand rejected under 35 U.S.C. § 103 as obvious over U.S. Patent No. 5,853,054 ("McGarian") in view of U.S. Patent No. 5,607,025 ("Mensa-Wilmot '025"). This rejection is respectfully traversed.

Independent claim 132 recites an expandable reaming tool that includes at least two reamer pads, at least one blade formed on each of the at least two reamer pads, and a plurality of cutting elements disposed on the blades. The at least two reamer pads are operatively coupled to a tool body and adapted to be displaced between a retracted and an expanded position. Further, selected ones of the plurality of cutting elements disposed on one of the at least two reamer pads are positioned so as to form a redundant cutting arrangement with other selected ones of the plurality of cutting elements disposed on a different one of the at least two reamer pads.

As stated in the background of the present application (page 3, paras. 7-8), a cutting structure of a prior art near-bit reaming tool is typically symmetrical and includes

expandable pads that may be activated using hydraulic pressure. The pads include cutting elements which, commonly, are PDC cutters. However, the PDC cutters are generally arranged in a relatively simplistic fashion, and the entire cutting structure is, consequently, relatively rudimentary in design.

As described in the application, embodiments of the present invention advantageously provide a more advanced reamer by incorporating advanced cutting structures. Figures 2 and 3 of the present invention describe embodiments of the present invention. As shown in Figures 2 and 3, an expandable reamer pad (32A, 32B) includes one or more blades (50) disposed thereon, where each blade (50) has a plurality of cutting elements (52) fitted on an edge of the blade (50) that contacts a well formation. Advantageously, because the plurality of cutting elements are disposed on an edge of the blade (32A, 32B), rather than on the reamer pad (32A, 32B), a clearance between a well formation and a surface of the reamer pad may be increased, thereby improving a cutting transport and drilling fluid circulation of the reaming tool (page 12, para. 44). Further, a geometric configuration of the blade may be adapted in order to advantageously provide maximum cutting element exposure (page 12, paras. 45-46).

The Examiner asserts that McGarian discloses the invention of claim 132 except for the "redundant" cutters. The Examiner further asserts that Figs. 1, 2, and 5-9 illustrate some redundant cutting. The Applicant respectfully disagrees. McGarian specifically discusses the cutting element arrangement on the blades. The cutting elements "are suitably spaced and offset to give full area coverage as the tool rotates (Column 6, line 62)." At no point does McGarian teach or suggest arranging the cutting elements to provide for redundant cutting as provided in claim 132.

The Examiner asserts that combining the redundant cutting disclosed by Mensa-Wilmot '025 with McGarian would be obvious. The Applicant respectfully notes that no rationale for the obviousness of claim 132 has been asserted by the Examiner. Mensa-Wilmot '025 does not suggest that redundant cutting may be advantageous in other applications. The expandable under-reamer is not equivalent to a drill bit. Under-reamers enlarge holes that have typically been created by drill bits. The different roles of under-reamers and drill bits result in different challenges for efficient cutting. Mensa-Wilmot '025 focuses on the prevention of a decrease in stability as the drill bit wears. This improvement also leads to increased durability of the drill bit. The issues of the drill bit discussed by Mensa-Wilmot '025 cannot be directly applied to the expandable under-reamer because of their different roles and geometry. Neither McGarian nor Mensa-Wilmot '025 provides any suggestion (either explicitly or implicitly) or motivation to combine the teachings of the references in a manner that would render the present invention obvious. The Applicant respectfully notes that absent some suggestion or motivation to combine the prior art references, there is no *prima facie* case of obviousness.

Moreover, to the extent that the Examiner has provided any reasoning for the present rejection, the Applicant believes that the obviousness rejection is based on improper hindsight reconstruction. *See* MPEP § 2145. The Applicant's specification discloses that the present invention arises from applying drill bit technology to an expandable under-reamer in a manner that has not been previously attempted (page 3, para. 8). The Applicant believes that this knowledge provided the blueprint for the Examiner to combine McGarian with Mensa-Wilmot '025. Without reference to the

Applicant's specification, one of ordinary skill in the art would not look to the cited prior art references to create the combination disclosed in the Applicant's specification. Accordingly, withdrawal of the § 103 rejection of claim 132 is respectfully requested.

In view of the above, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in the claim 132. Thus, the claims are patentable over McGarian and Mensa-Wilmot '025. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 136 AND 147:

Claims 136 and 147 stand rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of either U.S. Patent No. 5,979,576 ("Hansen") or U.S. Patent No. 6,142,250 ("Griffin"). This rejection is respectfully traversed.

As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in claim 132. Further, neither Hansen nor Griffin shows or suggests that which is not provided in McGarian and Mensa-Wilmot '025. Hansen and Griffin teach how to reduce bit whirl by decreasing vibration. At no point do they teach to reduce vibration by employing vibration damping inserts as in claim 136. At no point do they disclose or suggest the cutting element structure as presented in claim 147. In addition, with respect to this three-reference combination, the Examiner has not shown any motivation to combine the cited references.

Thus, claims 136 and 147, which are dependent from claim 132, are patentable over McGarian, Mensa-Wilmot '025, and Hansen or Griffin. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 137, 138, AND 144:

Claims 137, 138, and 144 stand rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of either U.S. Patent No. 6,269,893 ("Beaton") or U.S. Patent No. 6,516,293 ("Huang"). This rejection is respectfully traversed.

As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in claim 132. Further, Beaton and Huang, whether considered separately or in combination, fail to provide that which is not shown or suggested in McGarian and Mensa-Wilmot '025.

Beaton is non-analogous to the present invention. Beaton discloses a bi-centered drill bit with balanced forces. Teachings related to bi-center drill bits have little if any applicability to expandable under-reamers due to the entirely different structures of the two tools. A bi-center drill bit has challenges related to the asymmetric nature of the tool. An expandable under-reamer has different challenges. Therefore, the Applicant believes that Beaton cannot render claims 137, 138, and 142 obvious.

In addition to the above arguments, one of ordinary skill in the art would have no motivation to combine Huang or Beaton with McGarian and Mensa-Wilmot '025. Thus, claims 137-138 and 144, which depend from claim 132, are patentable over McGarian,

Mensa-Wilmot '025, Beaton, and Huang. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 141 AND 142:

Claims 141 and 142 stand rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of U.S. Patent No. 6,164,394 ("Mensa-Wilmot '394"). This rejection is respectfully traversed.

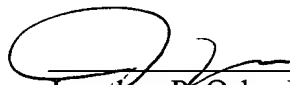
As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in claim 132. Further, Mensa-Wilmot '394 fails to show or suggest that which is not provided in McGarian and Mensa-Wilmot '025. Thus, claims 136 and 147, which are dependent from claim 132, are patentable over McGarian, Mensa-Wilmot '025, and Mensa-Wilmot '394. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

The Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 05516/089001).

Respectfully submitted,

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